



FIG 1.

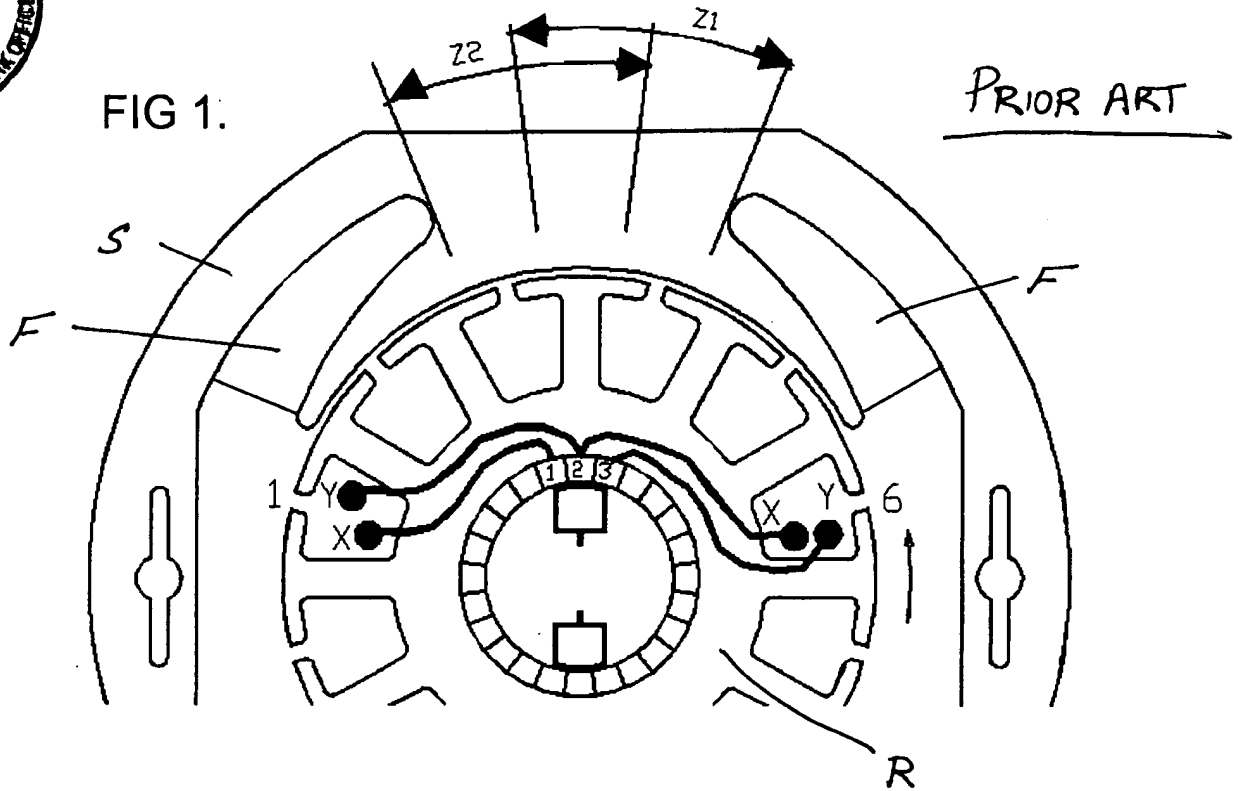


FIG 5

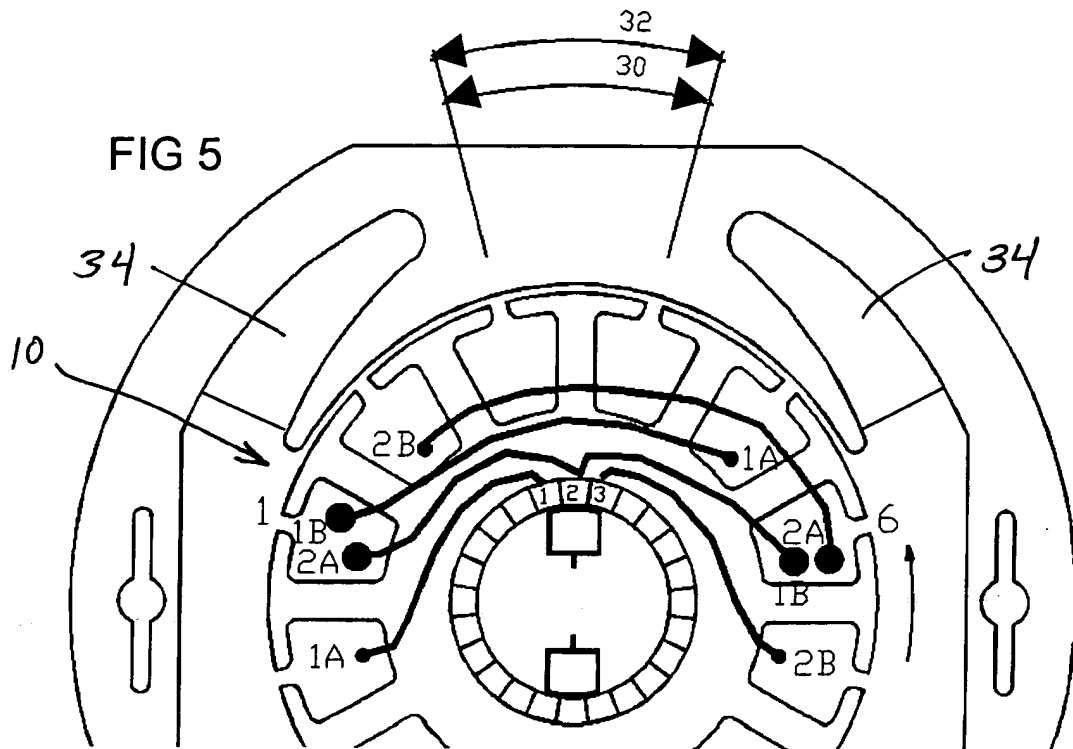


Figure 1a (PRIOR ART)

Slot Number

12 1 2 3 4 5 6 7

Zone Z1 (30°)

FIELD

X X

18 19 20 21 22 23 24 1 2 3 4 5 6 7 8 9 10

BRUSH

Fig. 1a (PRIOR ART)

Fig. 1a (PRIOR ART)

Figure 1c
Slot Number 22222222

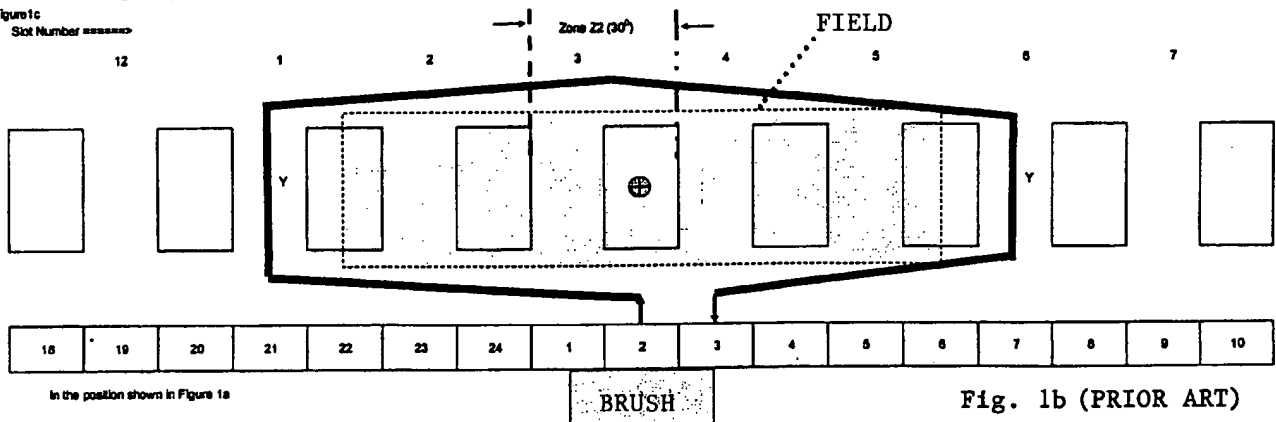



Fig. 1b (PRIOR ART)

 **MAGNETIC AXIS of total coil**
 ————— Axis of field pole and brush
 ————— Position of **MAGNETIC AXIS** at start of commutation
 - - - - - Position of **MAGNETIC AXIS** at end of commutation

3/10

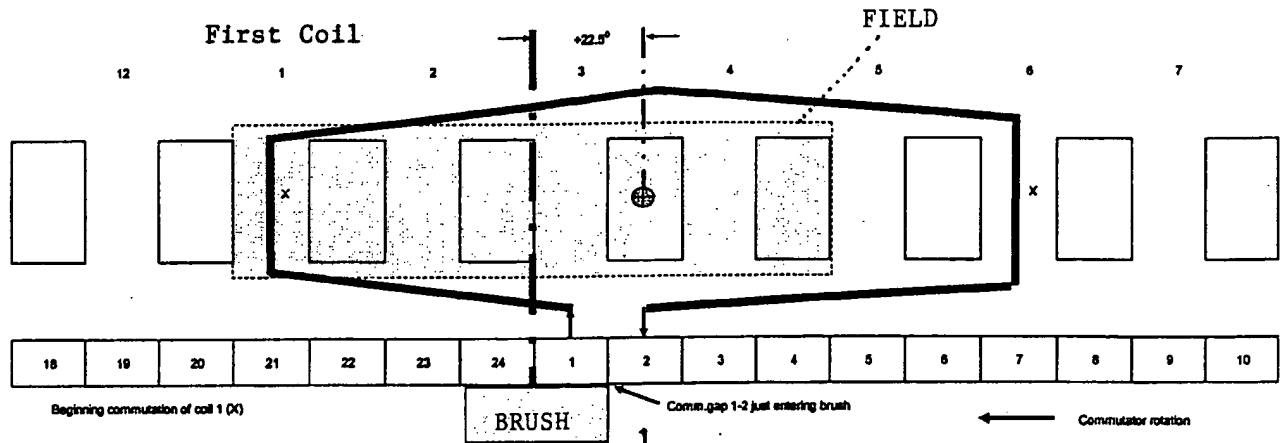


Fig. 1c (PRIOR ART)

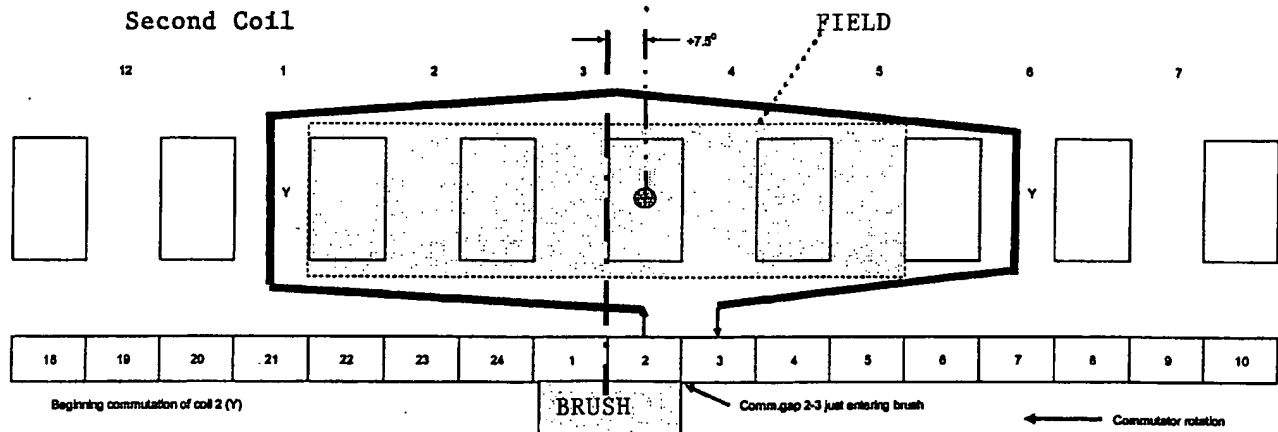






Fig. 1d (PRIOR ART)

Key:

-  MAGNETIC AXIS of total coil
-  Axis of field pole and brush
-  Position of MAGNETIC AXIS at start of commutation
-  Position of MAGNETIC AXIS at end of commutation

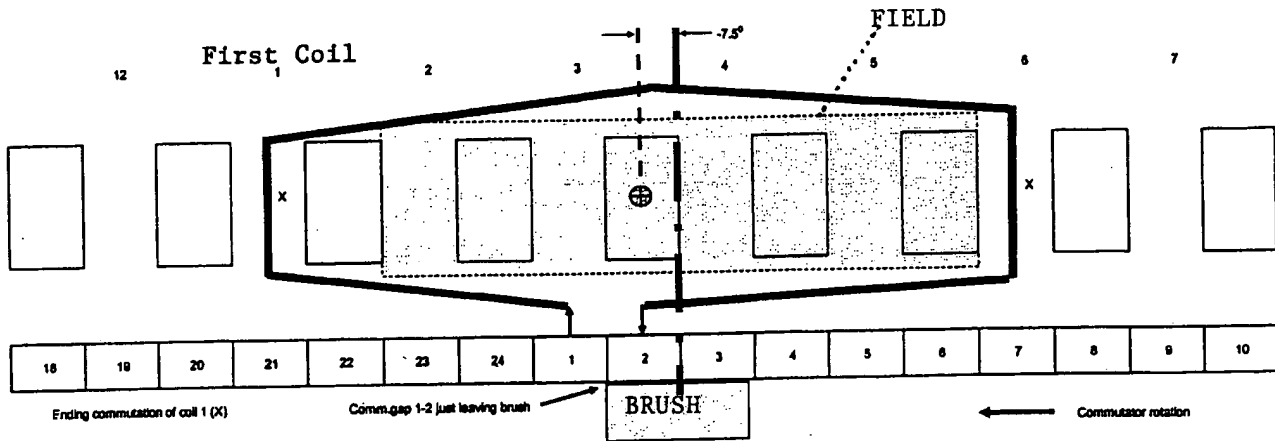


Fig. 1e (PRIOR ART)

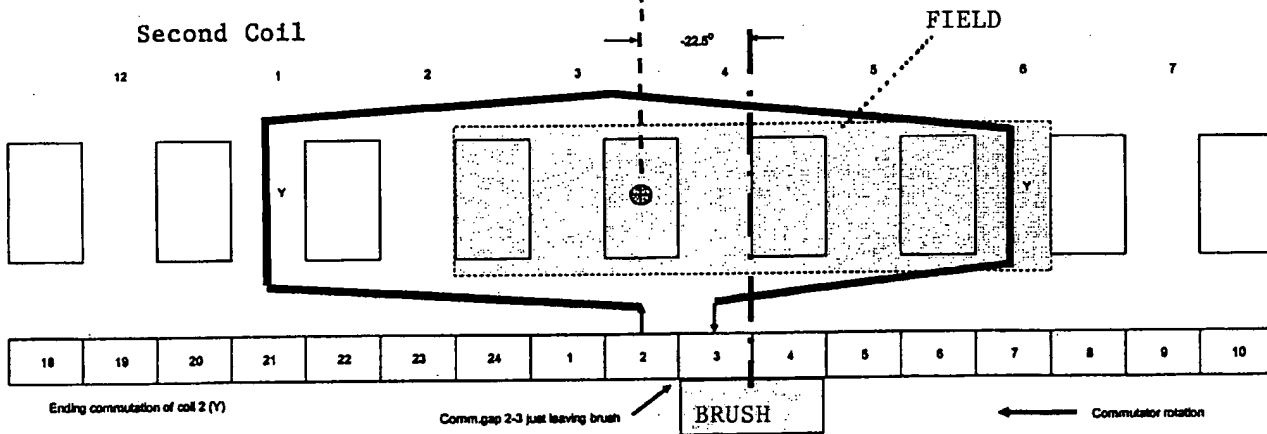




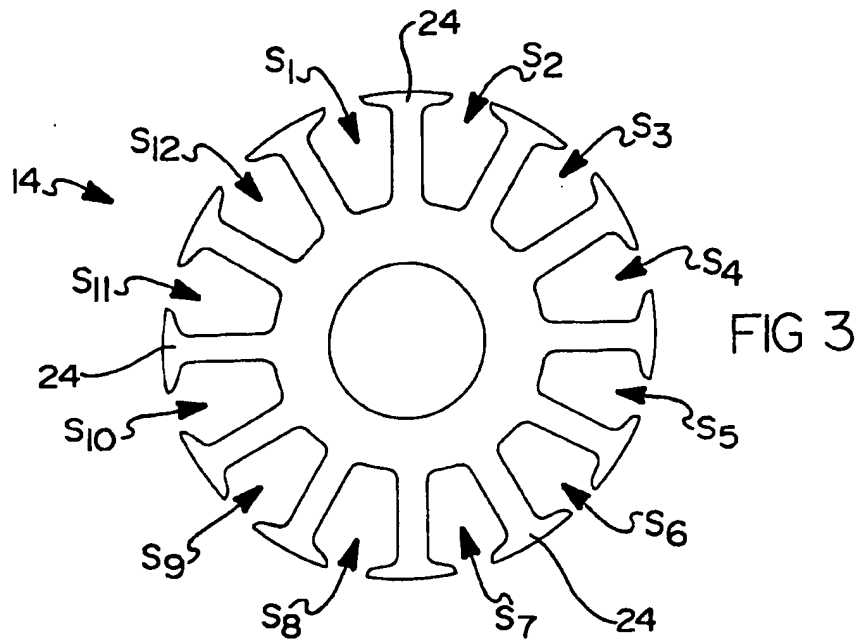
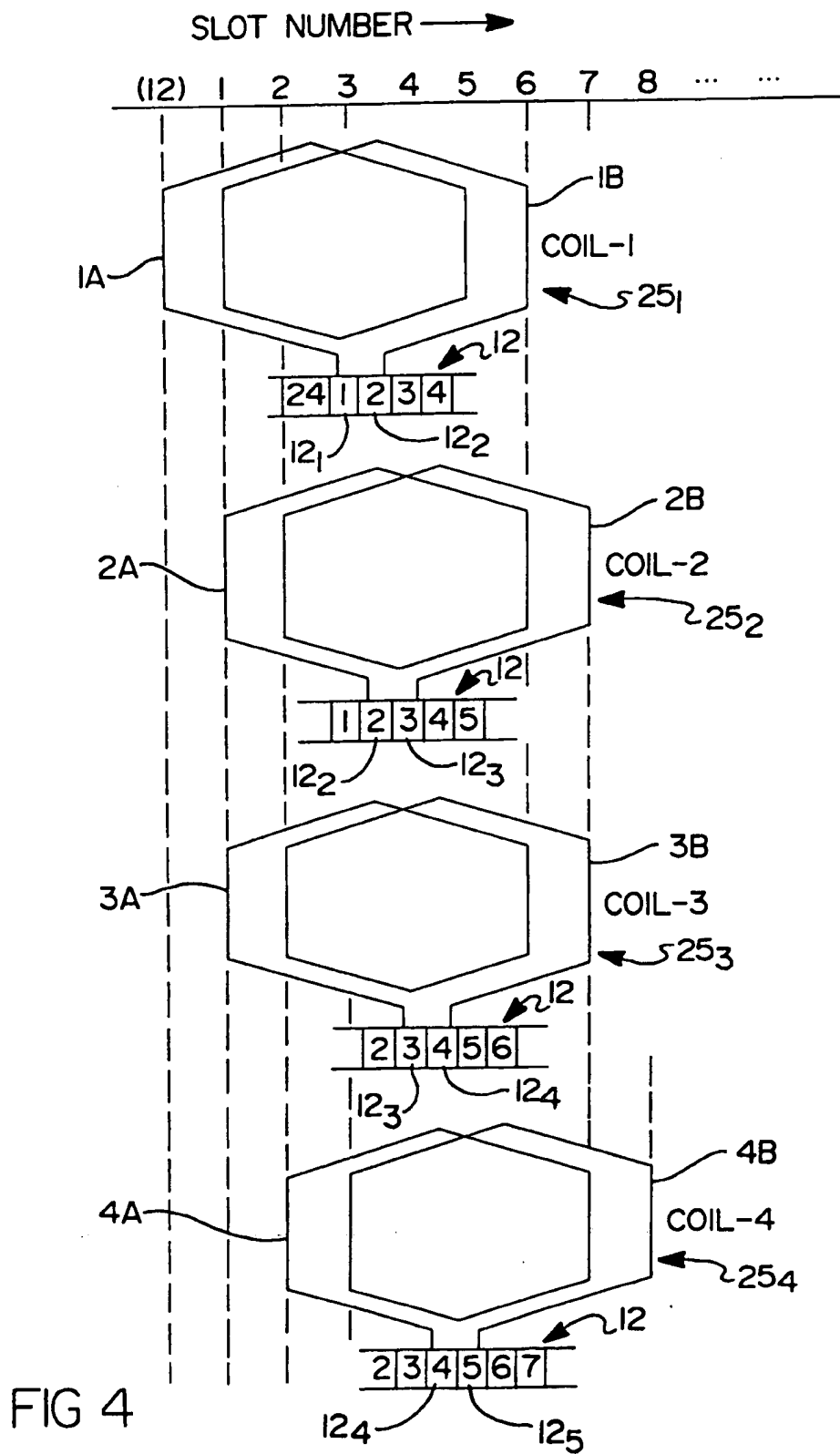


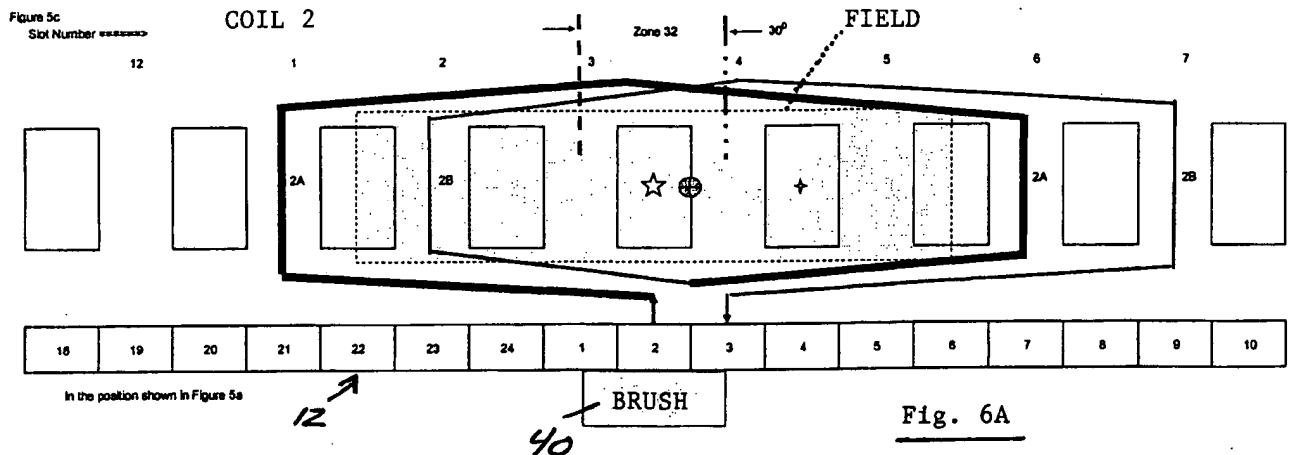
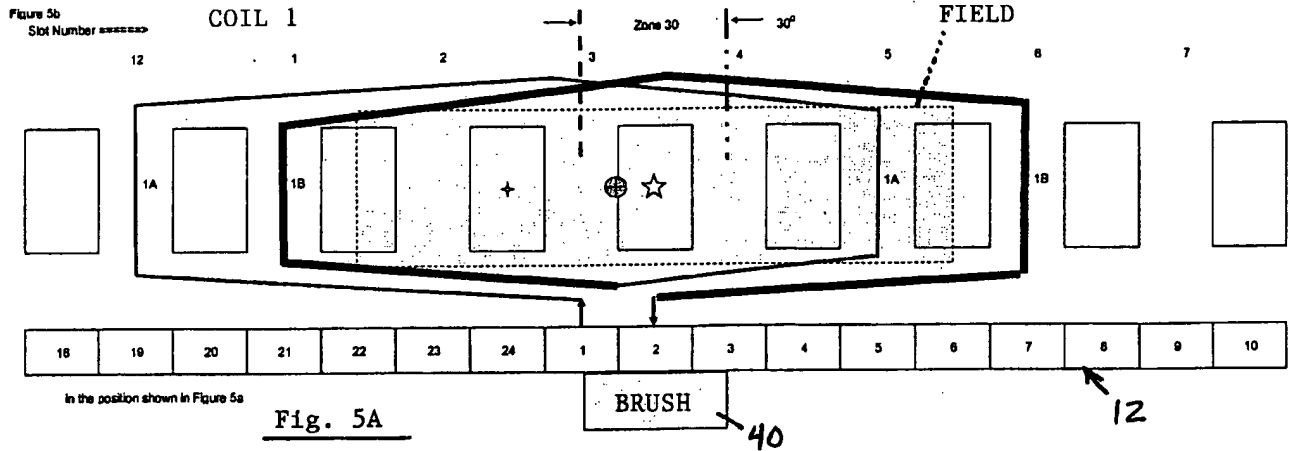
Fig. 1f (PRIOR ART)

 MAGNETIC AXIS of total coil
 Axis of field pole and brush
 Position of MAGNETIC AXIS at start of commutation
 Position of MAGNETIC AXIS at end of commutation



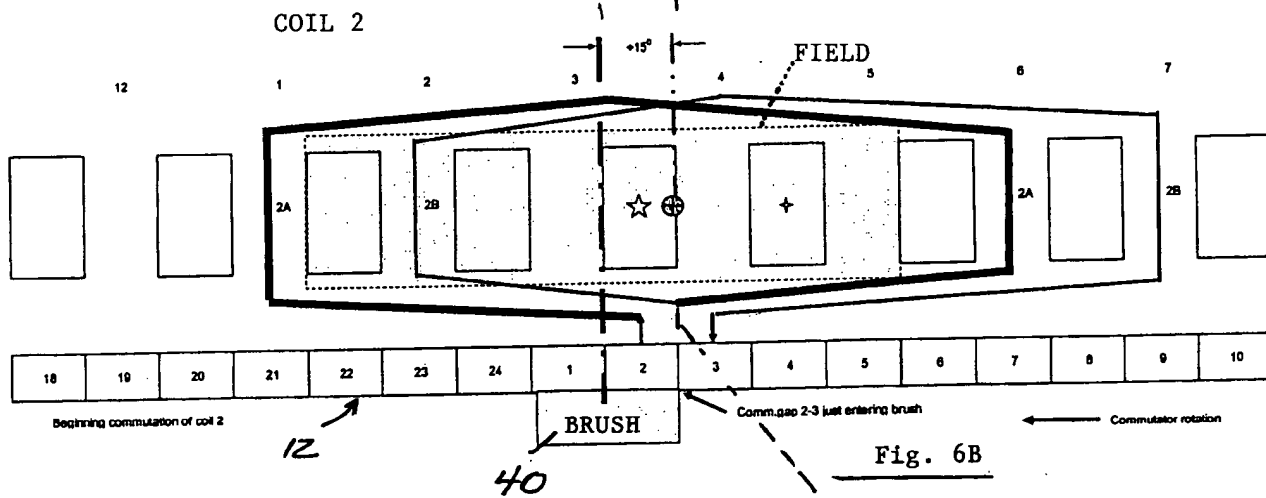
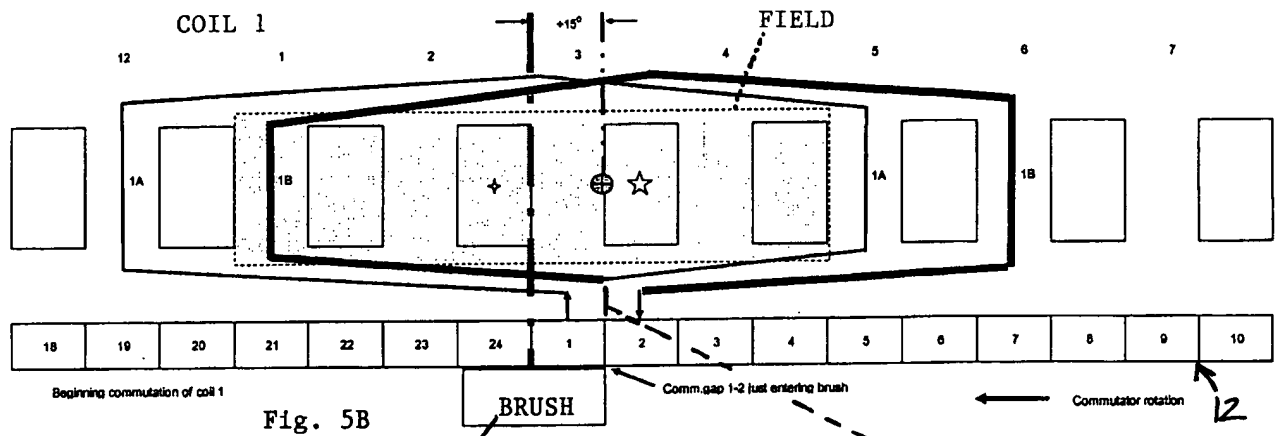


8/10



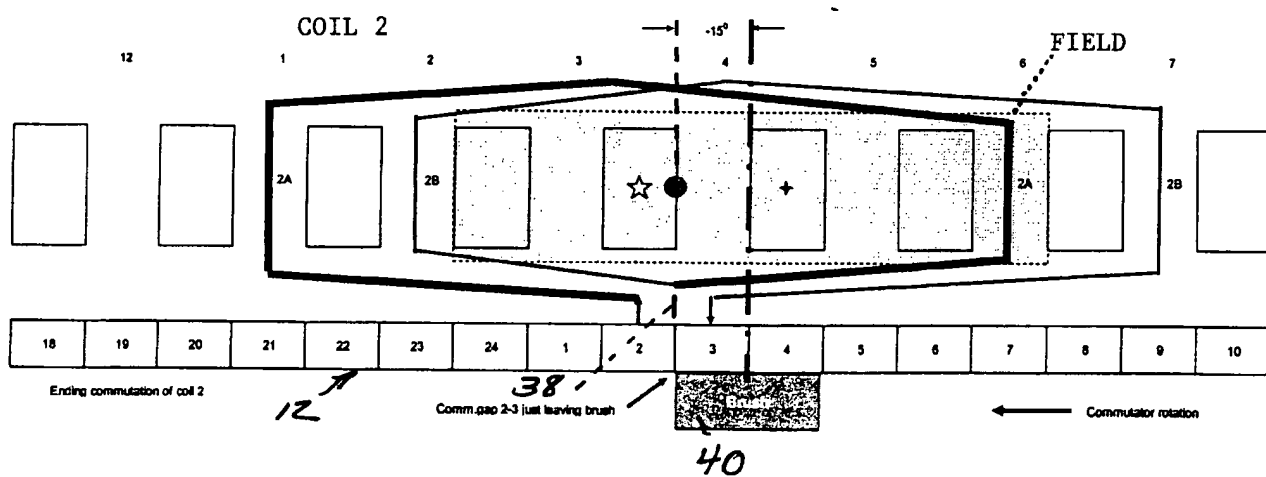
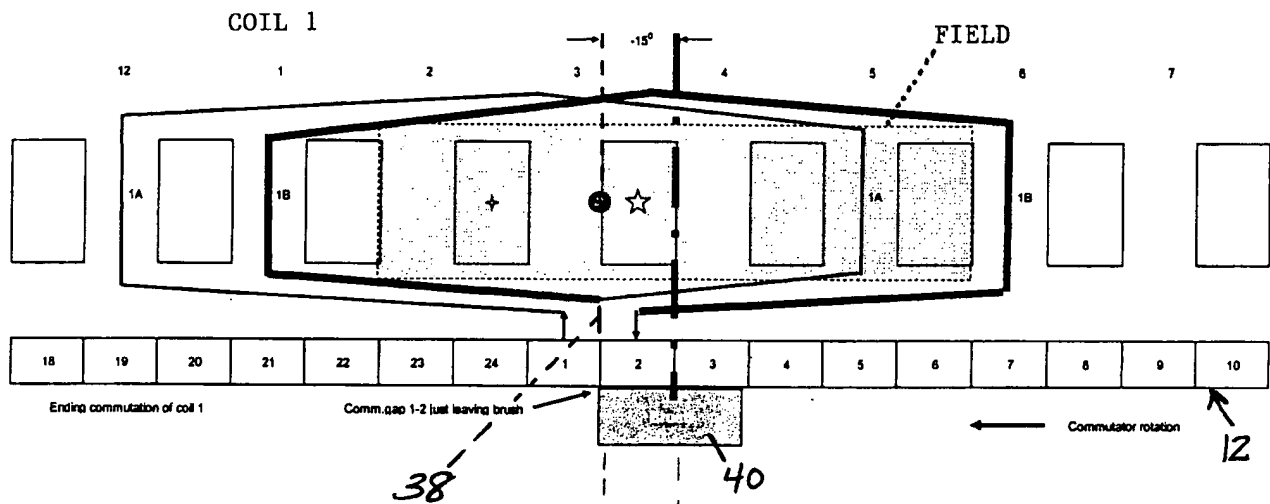
- Key:
- ☆ Magnetic axis of larger subcoil
 - ⊕ Magnetic axis of smaller subcoil
 - ⊕ MAGNETIC AXIS of total coil (resultant)
 - Axis of field pole and brush
 - Position of MAGNETIC AXIS at start of commutation
 - ... Position of MAGNETIC AXIS at end of commutation

9/10



- Key:
- ★ Magnetic axis of larger subcoil
 - ⊕ Magnetic axis of smaller subcoil
 - ⊕⊕ MAGNETIC AXIS of total coil (resultant)
 - Axis of field pole and brush
 - Position of MAGNETIC AXIS at start of commutation
 - Position of MAGNETIC AXIS at end of commutation

10/10



- Key:
- ☆ Magnetic axis of larger subcoil
 - + Magnetic axis of smaller subcoil
 - MAGNETIC AXIS of total coil (resultant)
 - Axis of field pole and brush
 - - - - - Position of MAGNETIC AXIS at start of commutation
 - Position of MAGNETIC AXIS at end of commutation